CALCIUM CYANAMIDE

Calcium cyanamide is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 156-62-7 CaNCN

Molecular Formula: $CCaN_2$

Calcium cyanamide occurs as glistening, hexagonal crystals. Pure calcium cyanamide is nonvolatile and noncombustible. However, commercial grades may contain small amounts of calcium carbide which will decompose in water to produce acetylene which is very flammable and used in welding. Commercial grades may occur as grayish-black lumps of powder. It is essentially insoluble in water, but undergoes partial hydrolysis to form soluble calcium hydrogen cyanamide (HSDB, 1991).

Physical Properties of Calcium Cyanamide

Synonyms: calcium carbimide; calcium salt; cyanamide; nitrolime

Molecular Weight:	80.11
Melting Point:	1340 ^oC
Heat of Fusion:	1.29 cal/g
Density/Specific Gravity:	2.29 at 20/4 ^oC (water = 1)

(HSDB, 1991; Merck, 1989)

SOURCES AND EMISSIONS

A. Sources

Calcium cyanamide is used in the manufacture of calcium cyanide, melamine, and dicyandiamide. Calcium cyanamide can be used in the hardening of iron and steel, and is used as a nitrogen source in fertilizer (Sax, 1989). In veterinary medicine, calcium cyanamide is used for the elimination of parasitic worms (Merck, 1989).

Calcium cyanamide was registered for use as a pesticide, however, as of December 3, 1986, it is no longer registered for pesticidal use in California (DPR, 1996).

B. Emissions

No emissions of calcium cyanamide from stationary sources in California were reported, based on data obtained from the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of calcium cyanamide was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of calcium cyanamide.

INDOOR SOURCES AND CONCENTRATIONS

No information about indoor sources and concentrations of calcium cyanamide was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Calcium cyanamide is expected to be particle-associated in the atmosphere, and hence subject to wet and dry deposition. The average half-life and lifetime for particles and particle-associated chemicals in the troposphere is estimated to be about 3.5 to 10 days and 5 to 15 days, respectively (Balkanski et al., 1993; Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Calcium cyanamide emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to calcium cyanamide are inhalation, ingestion, and dermal contact (U.S. EPA, 1994a).

Non-Cancer: Exposure to calcium cyanamide dust may cause irritation of skin, eyes, nose, throat, and respiratory tract (Sittig, 1991). Ingestion with alcohol may cause a disulfiram-like vasomotor reaction that results in intense localized erythematous flushing of the face, upper body, and arms, with headache, vertigo, nausea, and vomiting. Exposure causes sensitization dermatitis.

Long-term exposure may cause chronic rhinitis with perforation of the nasal septum and slow-healing dermal ulcerations (U.S. EPA, 1994a).

The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for calcium cyanamide (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects of calcium cyanamide in humans or animals (U.S. EPA, 1994a).

Cancer: No information is available on animal or human carcinogenicity. The International Agency for Research on Cancer and the U.S. EPA have not classified calcium cyanamide with respect to potential carcinogenicity (IARC, 1987a; U.S. EPA, 1994a).